



TWELFTH MONTHLY PROGRESS REPORT

IMAGE QUALITY METER
17 May through 17 June 1961

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The fabrication of the instrument is now completed except for the rocking mirror drive motor (a substitute motor is temporarily installed), and the vacuum platen (the flat platen is being used). The installation of these items awaits delivery from vendors of the necessary parts. Meanwhile, testing of the instrument has proceeded, with most satisfactory results. The production of a scanning spot of light which yields high resolution and low contrast "seeing" ability, the operation of the photomultiplier in conjunction with the light collection system, and, in fact, the operation of the entire system, has been achieved and appears to be in accordance with the design objectives. The resolution tests are preliminary, but they indicate that the 5 micron function (slit or spot) is being achieved, and the photomultiplier output is responsive to grain noise at levels well above the electronic noise of the system. Further, the electronic computers are performing in accordance with their design objectives.

The tests have revealed several areas where a change in design is dictated. These are described in the paragraphs to follow. In every case, except the viewing optics, the actions necessary to achieve these changes have been initiated.

The computers require a variable bandpass filter at their inputs in order to make the computations pertain to the desired information on the photograph.

A variable threshold, set differently for the acutance and resolution computers, may be required, leading to separating the input circuitry now common to both computers. The changes desired in the electronics are not known fully at this time, and will be resolved when the other relating to the mechanics of the instruments have been implemented.

A fine positioning system for moving the input film in small increments is required as an operational convenience. This will be achieved by a leadscrew attached to the rocking mirror sub-assembly.

The table mounting and raising mechanism requires modifications to insure greater rigidity and smoother motion.

DECLASS REVIEW by NIMA/DOD

A focus adjustment accessible to the operator is necessary to achieve the higher resolution of which the instrument is capable.

Some means of viewing the area to be scanned in order to permit closer operator control and selection is necessary. This may be achieved by designing and installing an optical system similar to that to be employed in the Image Enhancement Instrument.

Some very excellent resolution material in the form of high and low contrast bar pattern images have been received from Government engineering representatives, and will be used for resolution calibration. However, calibration material for acutance and granularity is also necessary, and, since this material is not available, it is planned to prepare uncalibrated test material and calibrate the instrument by hand computation. For example, the acutance of the test samples will be computed from the microdensitometer trace, and the reading of the acutance computer adjusted to conform. The granularity will be calibrated in a like manner, except it may be feasible to utilize an r.m.s. voltmeter, which in conjunction with the density calibration of the instrument, will permit calibration of the granularity scale. The preparation and calibration of this test material will introduce further delays. When the corrective actions outlined above have been achieved it will be possible to better establish a delivery date for the instrument. As originally contemplated, the calibration, evaluation, and collection of data for the Operations manual will require two months.

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